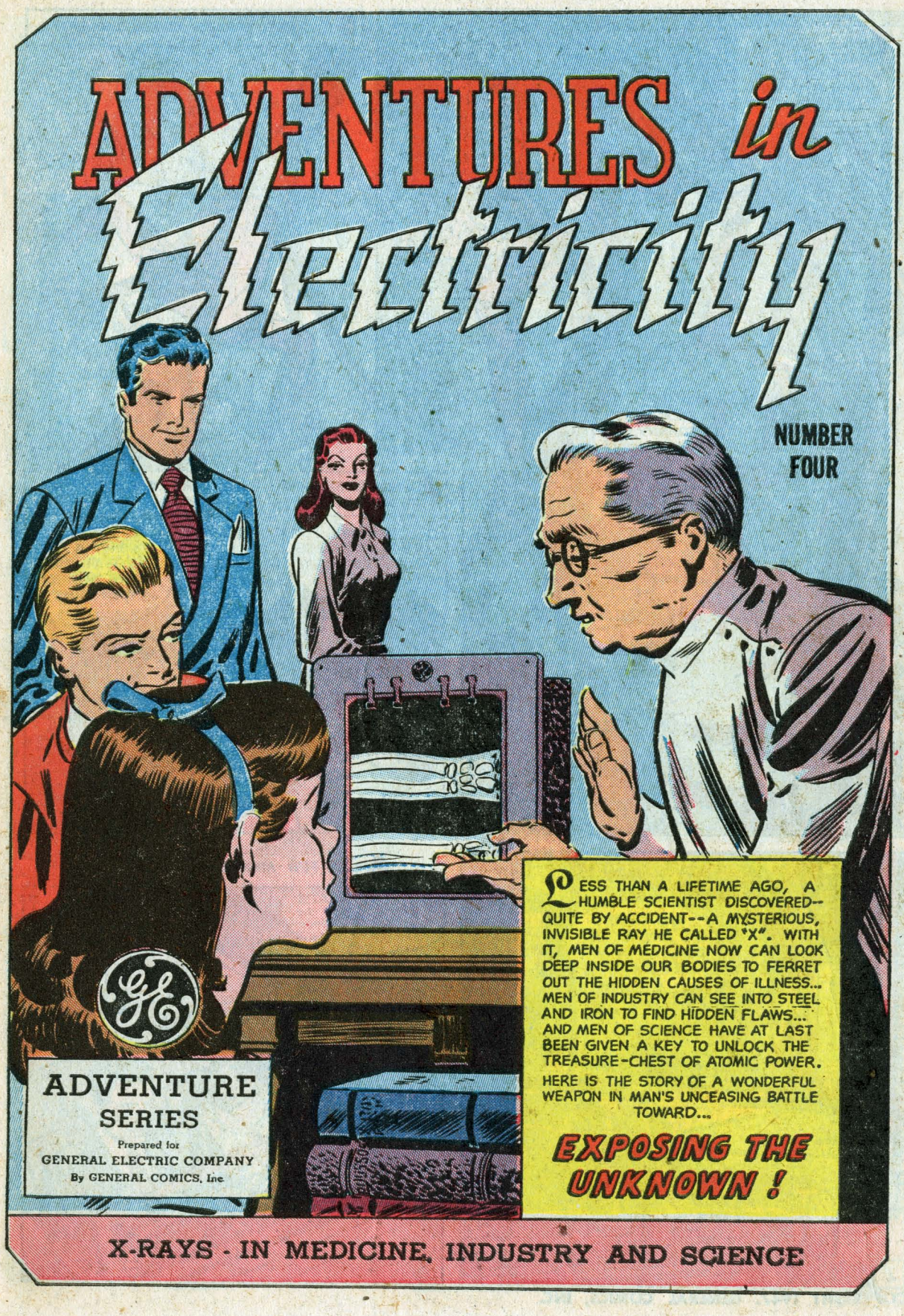
ADVENTURES in Electricity
NUMBER FOUR
LESS THAN A LIFETIME AGO, A HUMBLE SCIENTIST DISCOVERED--QUITE BY ACCIDENT--A MYSTERIOUS, INVISIBLE RAY HE CALLED "X". WITH IT, MEN OF MEDICINE NOW CAN LOOK DEEP INSIDE OUR BODIES TO FERRET OUT THE HIDDEN CAUSES OF ILLNESS... MEN OF INDUSTRY CAN SEE INTO STEEL AND IRON TO FIND HIDDEN FLAWS... AND MEN OF SCIENCE HAVE AT LAST BEEN GIVEN A KEY TO UNLOCK THE TREASURE-CHEST OF ATOMIC POWER.
HERE IS THE STORY OF A WONDERFUL WEAPON IN MAN'S UNCEASING BATTLE TOWARD...
EXPOSING THE UNKNOWN!
ADVENTURE SERIES
Prepared for
GENERAL ELECTRIC COMPANY
By GENERAL COMICS, Inc.
X-RAYS - IN MEDICINE, INDUSTRY AND SCIENCE

YOUNG JOHNNY POWERS IS ON A RESCUE MISSION, WHEN SUDDENLY...
CR-A-A-CK!
LOOK OUT, JOHNNY... THE BRANCH!
BUT JANE'S WARNING COMES TOO LATE...
JOHNNY'S BROTHER, ED POWERS, CHECKS UP ON THE DAMAGE...
OH, JOHNNY, I'M SO SORRY! DOES YOUR ARM HURT MUCH?
SHUCKS, NO ...UH...WELL, SORT OF... BUT I'M SURE IT'S OKAY.
WELL, DON'T BE TOO SURE, JOHNNY. A FALL LIKE THAT MIGHT HAVE BROKEN YOUR ARM!
...AND THERE'S ONE WAY TO FIND OUT... AN X-RAY. LET'S GO!
AND A FEW MINUTES LATER...
SAY, ED, WHAT'S AN X-RAY, ANYHOW?
IT'S A KIND OF INVISIBLE LIGHT WAVE, JANE.

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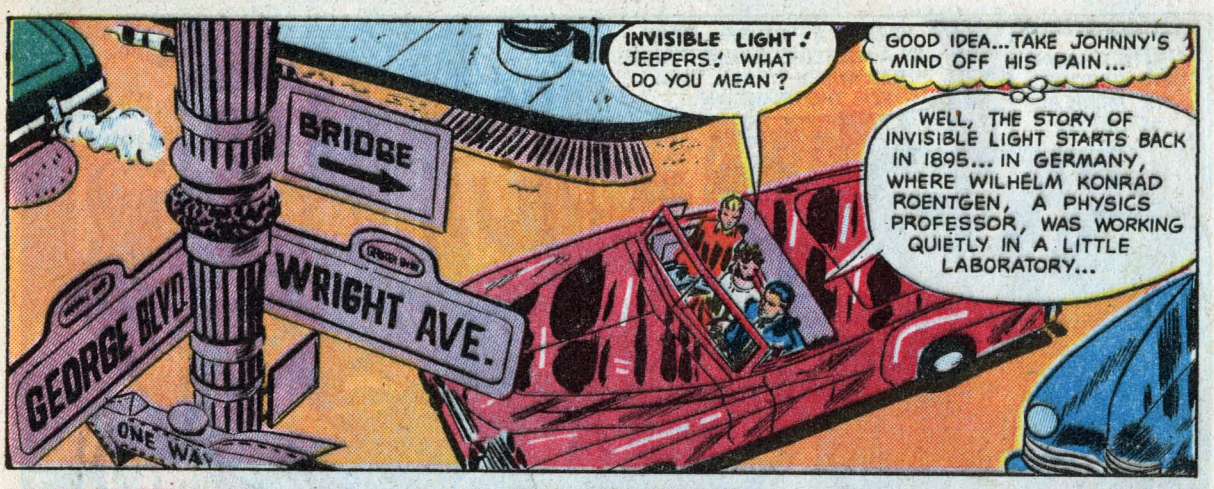
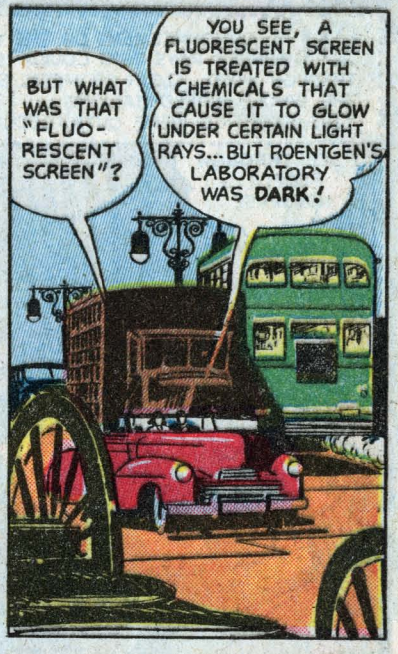
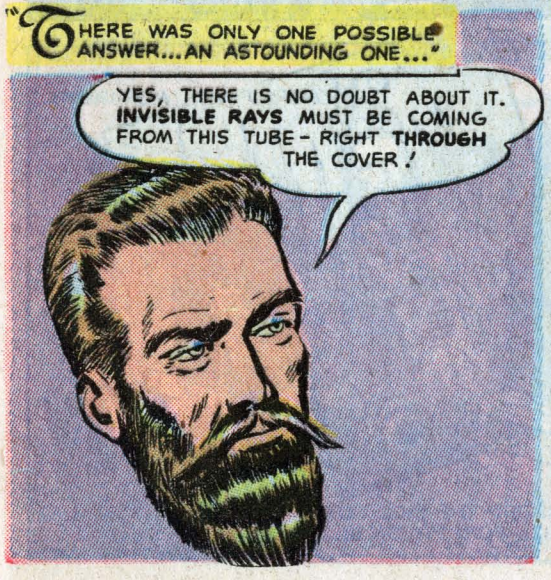
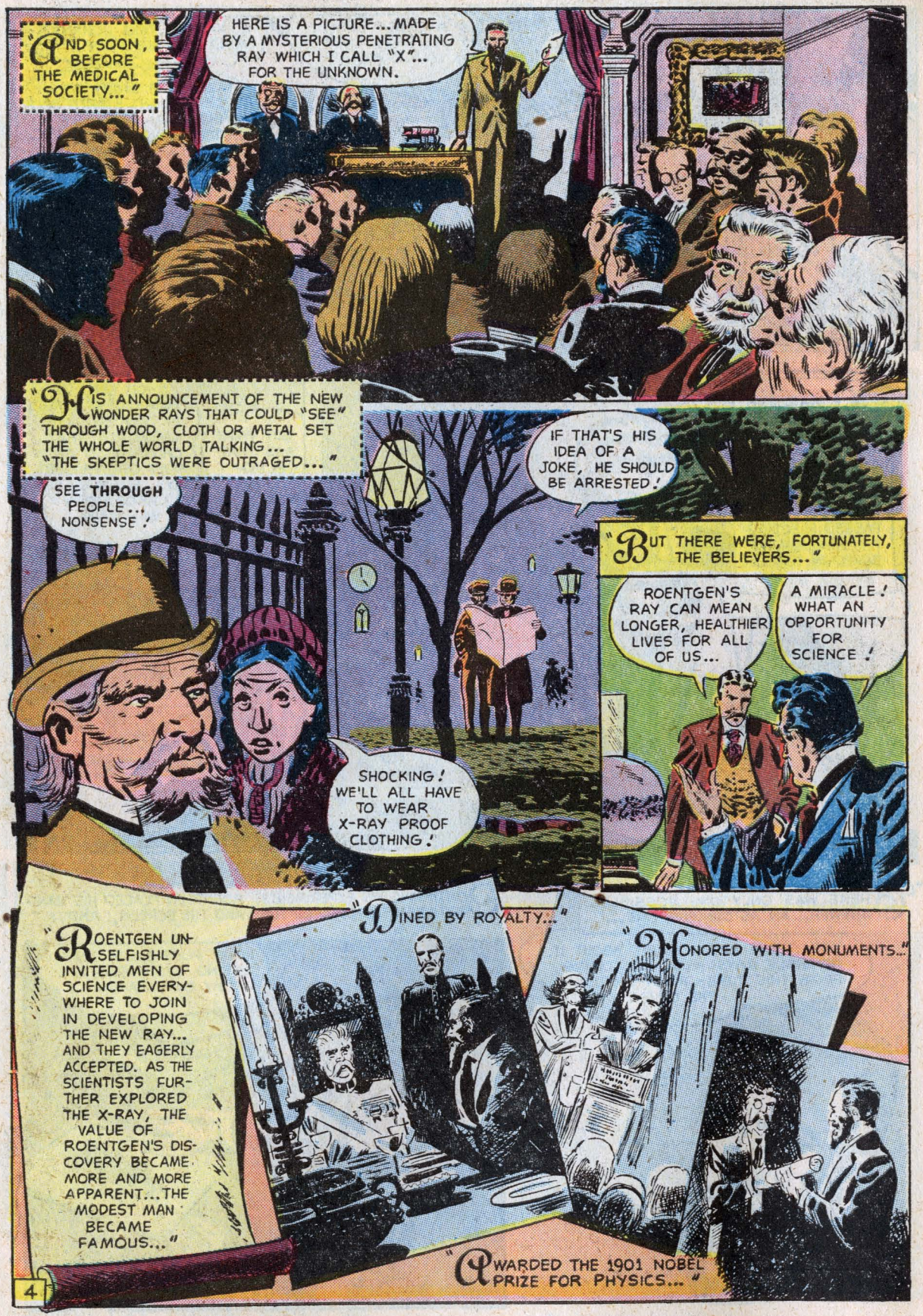

BRIDGE
GEORGE BLVD.
WRIGHT AVE.
ONE WAY
INVISIBLE LIGHT! JEEPERS! WHAT DO YOU MEAN?
GOOD IDEA...TAKE JOHNNY'S MIND OFF HIS PAIN...
WELL, THE STORY OF INVISIBLE LIGHT STARTS BACK IN 1895... IN GERMANY, WHERE WILHELM KONRAD ROENTGEN, A PHYSICS PROFESSOR, WAS WORKING QUIETLY IN A LITTLE LABORATORY...

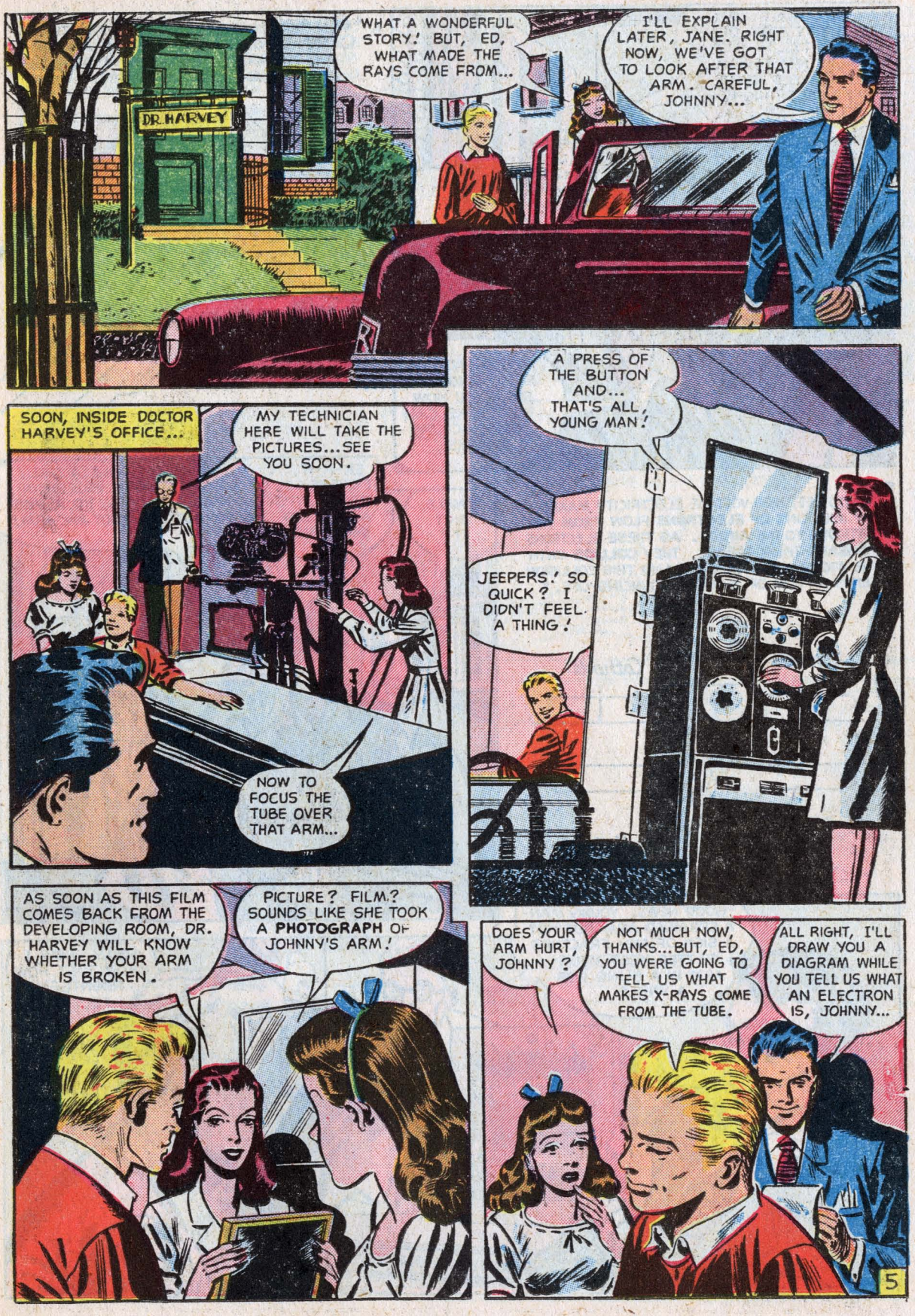
"HE WAS EXPERIMENTING WITH A CROOKES TUBE - A SIMPLE GLASS VACUUM BULB. THE ROOM WAS DARKENED AND, AS HE PASSED ELECTRICITY THROUGH THE BOXED-IN TUBE..."
DO MY EYES DECEIVE ME? THE FLUORESCENT SCREEN... IT GLOWS WITHOUT LIGHT! BUT WHY?


BUT WHAT WAS THAT "FLUORESCENT SCREEN"?
YOU SEE, A FLUORESCENT SCREEN IS TREATED WITH CHEMICALS THAT CAUSE IT TO GLOW UNDER CERTAIN LIGHT RAYS... BUT ROENTGEN'S LABORATORY WAS DARK!


"THERE WAS ONLY ONE POSSIBLE ANSWER...AN ASTOUNDING ONE..."
YES, THERE IS NO DOUBT ABOUT IT. INVISIBLE RAYS MUST BE COMING FROM THIS TUBE - RIGHT THROUGH THE COVER!

"CONTINUING HIS EXPERIMENTS, ROENTGEN PLACED HIS HAND BETWEEN THE COVERED TUBE AND THE SCREEN, AND..."
IS IT POSSIBLE? I AM SEEING THE INSIDE OF MY OWN HAND!
3

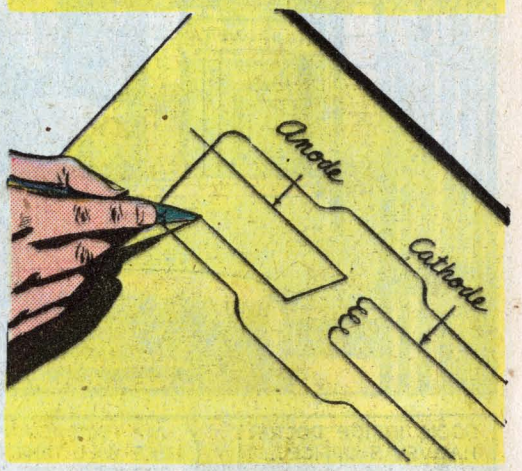

"AND SOON, BEFORE THE MEDICAL SOCIETY..."
HERE IS A PICTURE... MADE BY A MYSTERIOUS PENETRATING RAY WHICH I CALL "X"... FOR THE UNKNOWN.
"HIS ANNOUNCEMENT OF THE NEW WONDER RAYS THAT COULD "SEE" THROUGH WOOD, CLOTH OR METAL SET THE WHOLE WORLD TALKING... "THE SKEPTICS WERE OUTRAGED..."
SEE THROUGH PEOPLE... NONSENSE!
IF THAT'S HIS IDEA OF A JOKE, HE SHOULD BE ARRESTED!
SHOCKING! WE'LL ALL HAVE TO WEAR X-RAY PROOF CLOTHING!
"BUT THERE WERE, FORTUNATELY, THE BELIEVERS..."
ROENTGEN'S RAY CAN MEAN LONGER, HEALTHIER LIVES FOR ALL OF US...
A MIRACLE! WHAT AN OPPORTUNITY FOR SCIENCE!
"ROENTGEN UNSELFISHLY INVITED MEN OF SCIENCE EVERYWHERE TO JOIN IN DEVELOPING THE NEW RAY... AND THEY EAGERLY ACCEPTED. AS THE SCIENTISTS FURTHER EXPLORED THE X-RAY, THE VALUE OF ROENTGEN'S DISCOVERY BECAME MORE AND MORE APPARENT... THE MODEST MAN BECAME FAMOUS..."
"DINED BY ROYALTY..."
"HONORED WITH MONUMENTS..."
"AWARDED THE 1901 NOBEL PRIZE FOR PHYSICS..."


DR. HARVEY
WHAT A WONDERFUL STORY! BUT, ED, WHAT MADE THE RAYS COME FROM...
I'LL EXPLAIN LATER, JANE. RIGHT NOW, WE'VE GOT TO LOOK AFTER THAT ARM. CAREFUL, JOHNNY...
SOON, INSIDE DOCTOR HARVEY'S OFFICE...
MY TECHNICIAN HERE WILL TAKE THE PICTURES...SEE YOU SOON.
NOW TO FOCUS THE TUBE OVER THAT ARM...
A PRESS OF THE BUTTON AND... THAT'S ALL, YOUNG MAN!
JEEPERS! SO QUICK? I DIDN'T FEEL A THING!
AS SOON AS THIS FILM COMES BACK FROM THE DEVELOPING ROOM, DR. HARVEY WILL KNOW WHETHER YOUR ARM IS BROKEN.
PICTURE? FILM? SOUNDS LIKE SHE TOOK A PHOTOGRAPH OF JOHNNY'S ARM!
DOES YOUR ARM HURT, JOHNNY?
NOT MUCH NOW, THANKS...BUT, ED, YOU WERE GOING TO TELL US WHAT MAKES X-RAYS COME FROM THE TUBE.
ALL RIGHT, I'LL DRAW YOU A DIAGRAM WHILE YOU TELL US WHAT AN ELECTRON IS, JOHNNY...
5

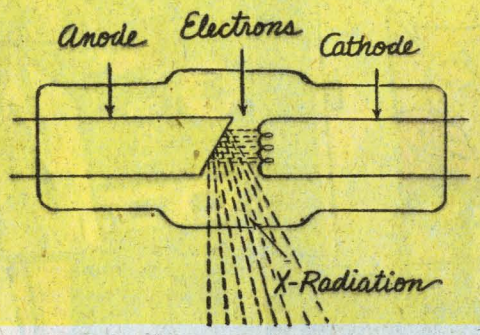
AN ELECTRON? WELL, IT'S A TINY ATOM OF ELECTRICITY... 'N' IT'S CHARGED NEGATIVELY... 'N' IT TRAVELS AWFUL FAST UNDER HIGH VOLTAGE... 'N'...

GOOD ENOUGH, JOHNNY... NOW I'LL SHOW YOU HOW ELECTRONS CAN MANUFACTURE X-RAYS.

"IN THIS SEALED GLASS TUBE ARE TWO METAL **POLES**... THE POSITIVE **ANODE** AND THE NEGATIVE **CATHODE**, ATTACHED TO AN ELECTRIC CIRCUIT."



"YOU SEE, HIGH VOLTAGE ELECTRICITY MAKES MILLIONS OF **ELECTRONS** FLOW FROM THE **CATHODE** TO THE **ANODE**. AS THESE ELECTRONS BOMBARD THEIR TARGET, THEY **COLLIDE** WITH THE ATOMS IN THE TARGET... AND THIS COLLISION SENDS A FLOW OF **X-RAYS** BOUNCING OFF."



SIMPLE, ISN'T IT?

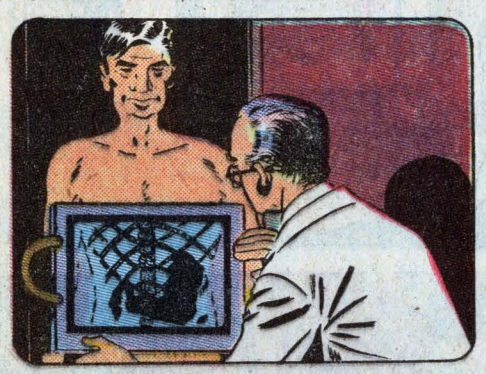
ER-R-R, I GUESS SO. ANYWAY, IT'S A **DARLING DRAWING!**

GOSH, JUST LIKE A GIRL! I UNDERSTAND IT, ED. OH-OH, HERE'S THE DOC. I'D ALMOST FORGOTTEN ABOUT MY ARM!

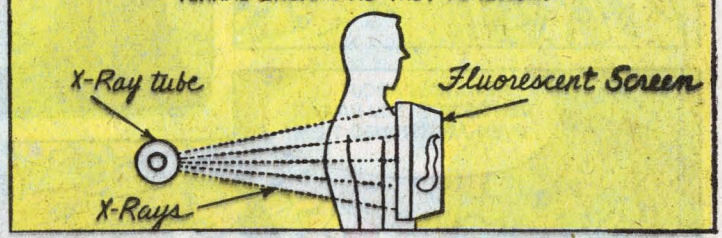
GOOD NEWS, YOUNG MAN- A SPRAINED ARM BUT NOT A SIGN OF ANY FRACTURE. BETTER KEEP YOUR ARM IN A SLING FOR A WHILE.

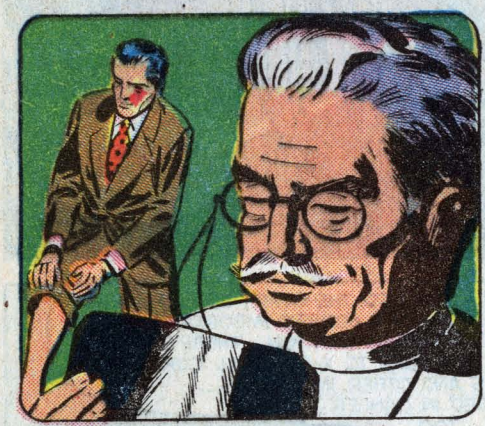
GOLLY, NOW I KNOW JUST HOW ROENTGEN FELT!

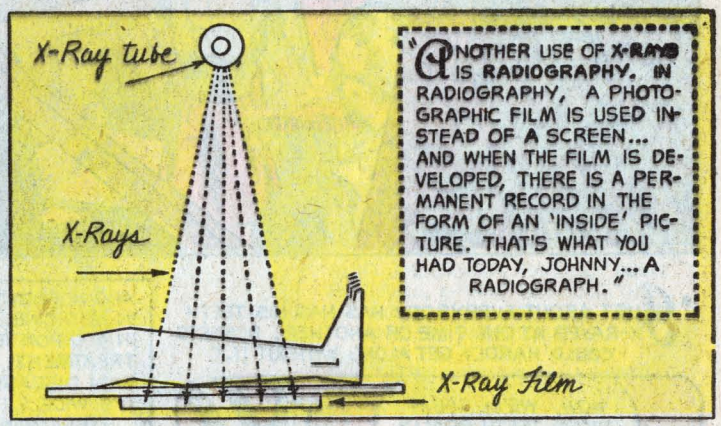
GLAD YOU'RE ALL RIGHT, JOHNNY... BUT YOU'RE **NOT** SEEING WHAT ROENTGEN SAW BACK IN 1895. HE SAW A **TEMPORARY** IMAGE OR SHADOWGRAPH... WHEN HE MOVED HIS HAND, THE SCREEN IMAGE MOVED, TOO.



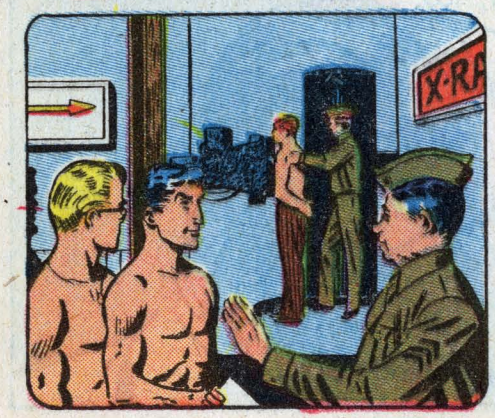
"THAT SAME TYPE OF FLUORESCENT SCREEN IS USED TODAY... IN **FLUOROSCOPY.** WITH FLUOROSCOPY, A DOCTOR CAN SEE AN IMMEDIATE AND TEMPORARY IMAGE. WITH IT, HE CAN WATCH A BROKEN BONE AS HE SETS IT, HE CAN WATCH INTERNAL ORGANS AS THEY FUNCTION."

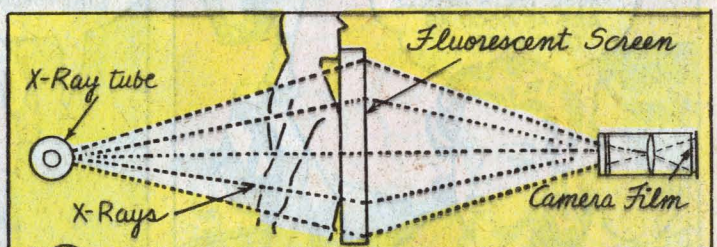






"ANOTHER USE OF X-RAYS IS **RADIOGRAPHY.** IN RADIOGRAPHY, A PHOTOGRAPHIC FILM IS USED INSTEAD OF A SCREEN... AND WHEN THE FILM IS DEVELOPED, THERE IS A PERMANENT RECORD IN THE FORM OF AN 'INSIDE' PICTURE. THAT'S WHAT YOU HAD TODAY, JOHNNY... A RADIOGRAPH."

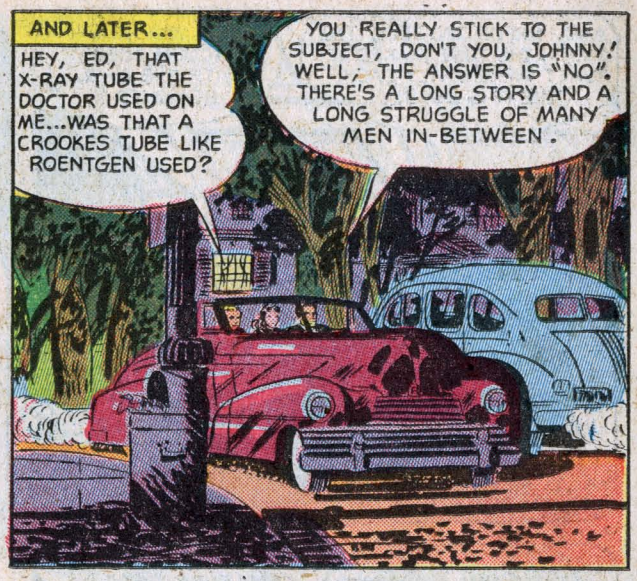


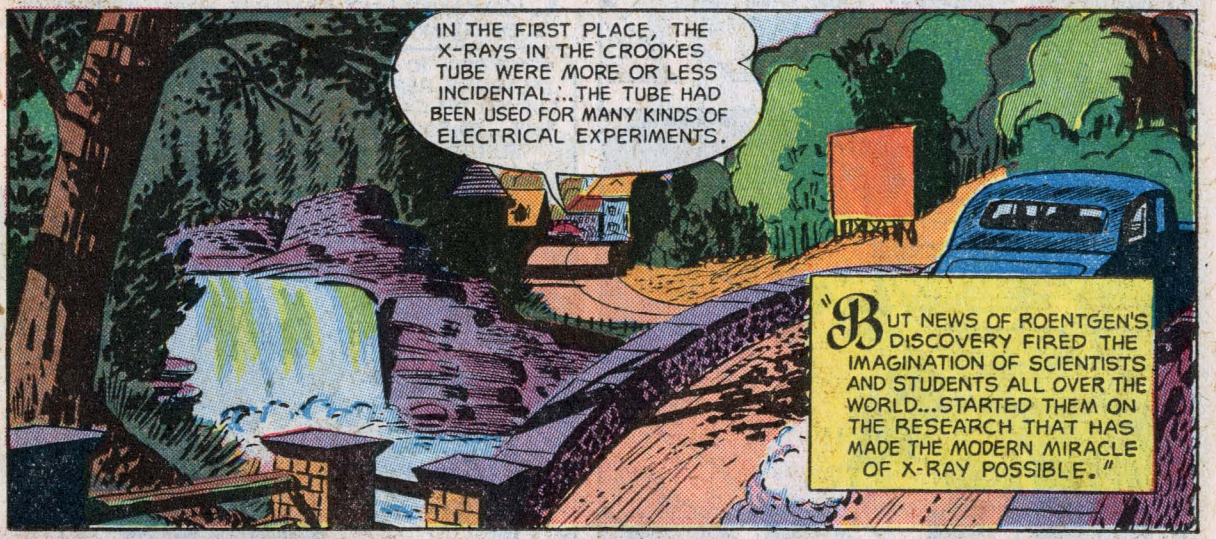


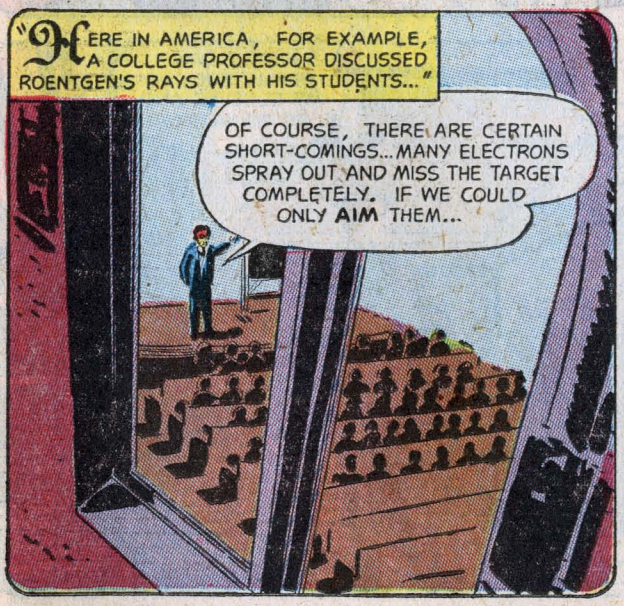
"AND THEN THERE IS A THIRD WAY X-RAYS ARE USED FOR EXAMINATION... THAT'S **PHOTO-ROENTGENOGRAPHY.** YOU SEE, RADIOGRAPHS ARE FULL-SIZE AND FAIRLY EXPENSIVE. DURING WORLD WAR II, WHEN IT WAS NECESSARY TO EXAMINE MILLIONS OF MEN QUICKLY AND ECONOMICALLY, THEY DEVELOPED A COMBINATION OF A FLUOROSCOPIC SCREEN AND A SMALL CAMERA WHICH MADE A SMALL-SIZED PHOTOGRAPH OF THE IMAGE ON THE SCREEN."

WHY, THAT SOUNDS JUST LIKE OUR CHEST EXAMINATIONS IN SCHOOL LAST WEEK. EVERYBODY WAS X-RAYED!
RIGHT! THROUGH MASS X-RAYS OF MILLIONS OF SCHOOL CHILDREN AND ADULTS, WE'RE ON THE WAY TO STAMPING OUT TUBERCULOSIS... BY LOCATING IT IN THE EARLY, CURABLE STAGES.
"IN ADDITION TO CLINICS AND PORTABLE X-RAY UNITS, THERE ARE MORE AND MORE MOBILE UNITS ON THE JOB TO KEEP AMERICA HEALTHY."
P.S. 125
JEEPERS, DOES IT HURT, ALICE?
NOT A BIT! AND IT ONLY TAKES A SECOND!
X-RAY UNIT
HEY... HOW ABOUT DENTISTS? YOU HAVEN'T EVEN MENTIONED THEM!
IT'S HARDLY NECESSARY TO, JANE--
"JUST ABOUT EVERYBODY HAS HAD HIS TEETH X-RAYED AT ONE TIME OR ANOTHER. DENTISTS COULD HARDLY GET ALONG WITHOUT IT."
NOW, WE'LL SEE IF THOSE TEETH REALLY ARE AS GOOD AS THEY LOOK!
AND NOBODY'S MENTIONED THE OTHER USE OF X-RAY IN MEDICINE... AND IT'S A MIGHTY IMPORTANT ONE! IN ADDITION TO X-RAY EXAMINATION, THERE'S X-RAY TREATMENT. EXPOSURE TO X-RAY WILL CURE MANY SKIN DISEASES AND OTHER INFECTIONS... IT'S WIDELY USED IN CANCER TREATMENT, TOO.
8

WELL, THANKS, DOCTOR, FOR THE GOOD NEWS ABOUT JOHNNY'S ARM.
AND THANKS TO BOTH OF YOU, I'M GOING TO DREAM ABOUT X-RAY TONIGHT.
GEE, I NEVER KNEW X-RAY WAS SO IMPORTANT!


AND LATER...
HEY, ED, THAT X-RAY TUBE THE DOCTOR USED ON ME...WAS THAT A CROOKES TUBE LIKE ROENTGEN USED?
YOU REALLY STICK TO THE SUBJECT, DON'T YOU, JOHNNY! WELL, THE ANSWER IS "NO". THERE'S A LONG STORY AND A LONG STRUGGLE OF MANY MEN IN-BETWEEN.


IN THE FIRST PLACE, THE X-RAYS IN THE CROOKES TUBE WERE MORE OR LESS INCIDENTAL...THE TUBE HAD BEEN USED FOR MANY KINDS OF ELECTRICAL EXPERIMENTS.
"BUT NEWS OF ROENTGEN'S DISCOVERY FIRED THE IMAGINATION OF SCIENTISTS AND STUDENTS ALL OVER THE WORLD...STARTED THEM ON THE RESEARCH THAT HAS MADE THE MODERN MIRACLE OF X-RAY POSSIBLE."

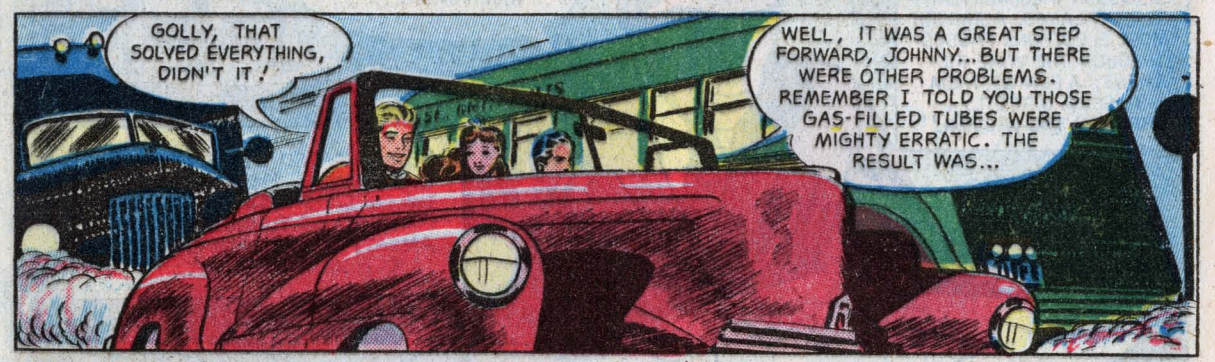

"HERE IN AMERICA, FOR EXAMPLE, A COLLEGE PROFESSOR DISCUSSED ROENTGEN'S RAYS WITH HIS STUDENTS..."
OF COURSE, THERE ARE CERTAIN SHORT-COMINGS...MANY ELECTRONS SPRAY OUT AND MISS THE TARGET COMPLETELY. IF WE COULD ONLY AIM THEM...

ALSO...WE CANNOT PRODUCE MORE POWERFUL X-RAYS BECAUSE THE ADDITIONAL HEAT CREATED WOULD MELT THE TARGET METAL.

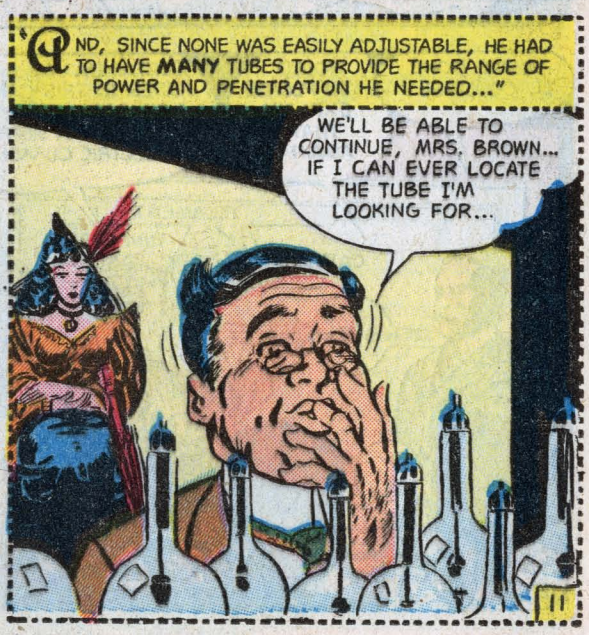
AND, UNFORTUNATELY, THE GAS IN THE TUBE MAKES IT REACT DIFFERENTLY EACH TIME IT IS USED...
THEN WHY NOT A VACUUM TUBE, WITH THE GAS REMOVED?
NO...YOU SEE, THE GAS IS NECESSARY TO FREE THE ELECTRONS FOR THEIR JOURNEY FROM CATHODE TO ANODE.
AND SO, GENTLEMEN, THE DIFFICULTIES TO OVERCOME ARE MANY...BUT, IF WE CAN OVERCOME THEM, WE SHALL HAVE SERVED HUMANITY WELL!
WHAT A WONDERFUL CHALLENGE THESE X-RAYS OFFER!
"THAT STUDENT, WILLIAM DAVID COOLIDGE, WAS TO BECOME ONE OF THE GREAT MEN IN X-RAY DEVELOPMENT!"
"COOLIDGE GRADUATED THAT YEAR AND, WHILE HE CONTINUED POST-GRADUATE WORK, AN ENGLISH SCIENTIST ANNOUNCED AN IMPORTANT DEVELOPMENT..."
ACCORDING TO SIR HERBERT JACKSON'S REPORT, HE HAS CURVED THE CATHODE...LIKE THIS...TO FOCUS ALL THE ELECTRONS IN A SMALL SPOT ON THE TARGET.
WONDERFUL! THAT'S ONE PROBLEM LICKED... BUT THERE ARE PLENTY MORE!
"SEVERAL YEARS AFTER GRADUATING FROM COLLEGE, COOLIDGE JOINED THE RESEARCH LABORATORY OF THE GENERAL ELECTRIC COMPANY..."
HERE I CAN REALLY ROLL UP MY SLEEVES AND GO TO WORK!

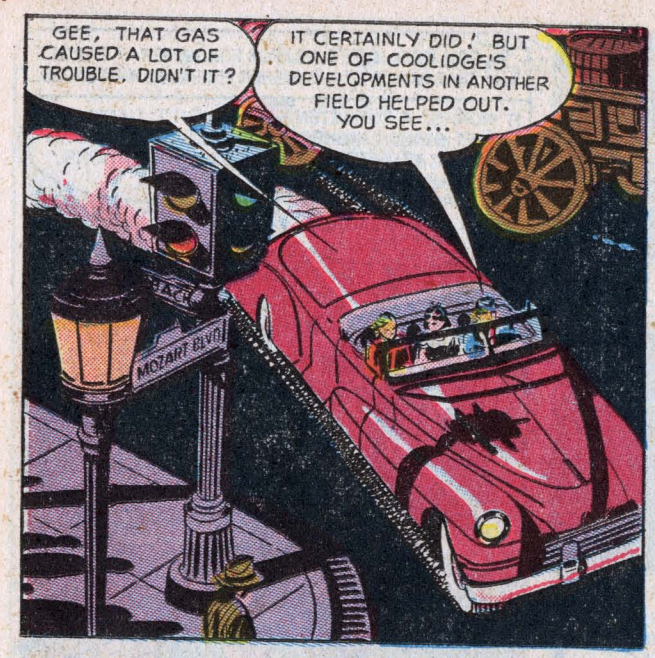
"AND 'GO TO WORK' HE DID.' WITH OTHER BRILLIANT SCIENTISTS HE TRIED, TESTED, EXPERIMENTED..."
BILL, THIS TUNGSTEN METAL POWDER JUST CAN'T BE MELTED DOWN.'
MAYBE IT CAN BE PRESSED INTO BARS AND HOT-FORGED... LET'S TRY IT.

"SOON, COOLIDGE'S SEARCH FOR AN X-RAY TARGET THAT WOULD STAND HIGHER ENERGIES WAS ENDED..."
IT WORKS.' A TUNGSTEN TARGET STANDS HIGHER TEMPERATURES.' THAT MEANS MORE POWERFUL X-RAYS THAN EVER BEFORE.'
I DIDN'T THINK IT COULD BE DONE.' CONGRATULATIONS.'

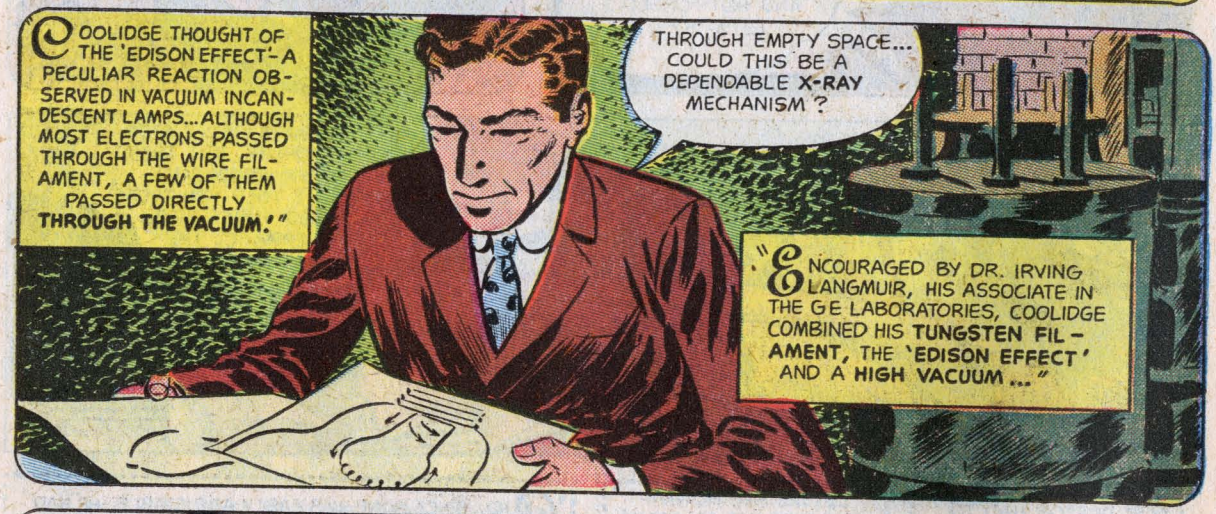

GOLLY, THAT SOLVED EVERYTHING, DIDN'T IT.'
WELL, IT WAS A GREAT STEP FORWARD, JOHNNY... BUT THERE WERE OTHER PROBLEMS. REMEMBER I TOLD YOU THOSE GAS-FILLED TUBES WERE MIGHTY ERRATIC. THE RESULT WAS...

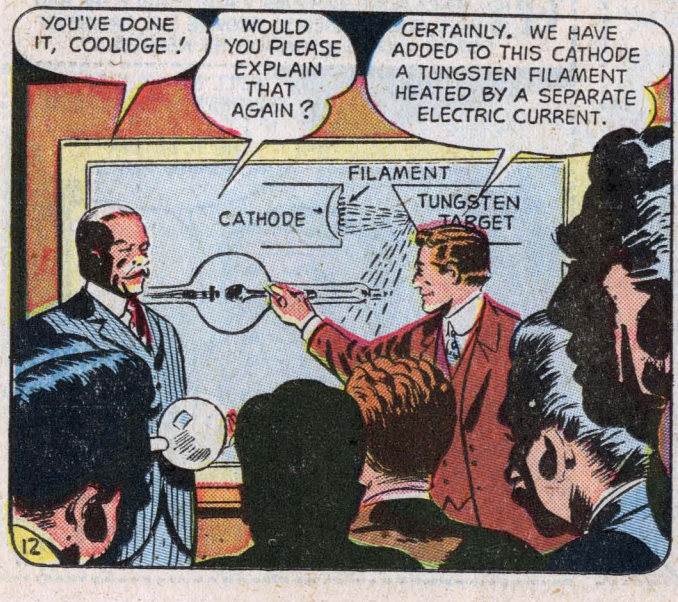
"DOCTOR HAD TO KEEP RECORDS OF EACH TUBE IN HIS RACK... AND HOPE FOR THE BEST..."
LET ME SEE NOW... THIS TUBE HAS "RESTED" FOR THREE DAYS. WONDER IF THE GAS PRESSURE IS BACK TO NORMAL?

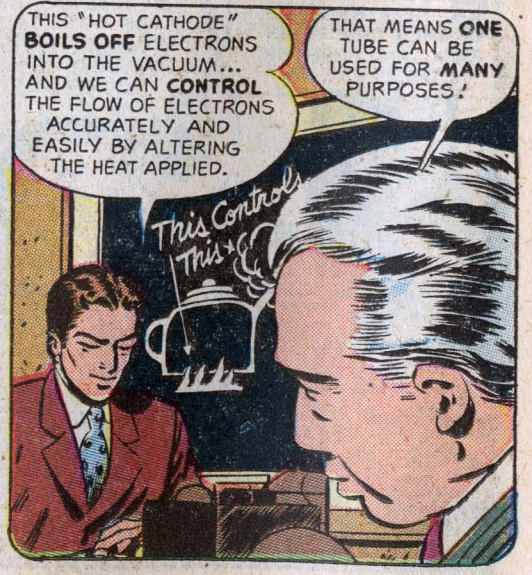

"AND, SINCE NONE WAS EASILY ADJUSTABLE, HE HAD TO HAVE MANY TUBES TO PROVIDE THE RANGE OF POWER AND PENETRATION HE NEEDED..."
WE'LL BE ABLE TO CONTINUE, MRS. BROWN... IF I CAN EVER LOCATE THE TUBE I'M LOOKING FOR...


GEE, THAT GAS CAUSED A LOT OF TROUBLE, DIDN'T IT?
IT CERTAINLY DID! BUT ONE OF COOLIDGE'S DEVELOPMENTS IN ANOTHER FIELD HELPED OUT. YOU SEE...
MOZART BLVD.

"COOLIDGE WAS ALSO WORKING ON THE DEVELOPMENT OF A BETTER LIGHT BULB..."
...NOW IF WE COULD ONLY MAKE THIS TUNGSTEN FILAMENT STRONG...
CAN'T SEE HOW, BILL. TUNGSTEN IS AS BRITTLE AS EGGSHELLS!
"BUT COOLIDGE STRUGGLED TO DO WHAT OTHER MEN THOUGHT IMPOSSIBLE... AND FINALLY, IN 1910, HE ANNOUNCED... DUCTILE - OR FLEXIBLE - TUNGSTEN! AND THEN..."


"COOLIDGE THOUGHT OF THE 'EDISON EFFECT' - A PECULIAR REACTION OBSERVED IN VACUUM INCANDESCENT LAMPS... ALTHOUGH MOST ELECTRONS PASSED THROUGH THE WIRE FILAMENT, A FEW OF THEM PASSED DIRECTLY THROUGH THE VACUUM!"
THROUGH EMPTY SPACE... COULD THIS BE A DEPENDABLE X-RAY MECHANISM?
"ENCOURAGED BY DR. IRVING LANGMUIR, HIS ASSOCIATE IN THE GE LABORATORIES, COOLIDGE COMBINED HIS TUNGSTEN FILAMENT, THE 'EDISON EFFECT' AND A HIGH VACUUM..."


YOU'VE DONE IT, COOLIDGE!
WOULD YOU PLEASE EXPLAIN THAT AGAIN?
CERTAINLY. WE HAVE ADDED TO THIS CATHODE A TUNGSTEN FILAMENT HEATED BY A SEPARATE ELECTRIC CURRENT.
FILAMENT
CATHODE
TUNGSTEN TARGET
12


THIS "HOT CATHODE" BOILS OFF ELECTRONS INTO THE VACUUM... AND WE CAN CONTROL THE FLOW OF ELECTRONS ACCURATELY AND EASILY BY ALTERING THE HEAT APPLIED.
THAT MEANS ONE TUBE CAN BE USED FOR MANY PURPOSES!
This Controls

"WITHIN A FEW SHORT YEARS, THE COOLIDGE 'HOT CATHODE' TUBE TOOK THE PLACE OF ALL EARLIER TYPES..."

BUT WHAT HAPPENED TO ALL YOUR X-RAY TUBES, DOCTOR?

THEY'RE ALL RIGHT HERE, MRS. BROWN... WRAPPED UP INTO ONE!

"BUT THERE WAS STILL WORK TO BE DONE. 40,000 AND 100,000-VOLT X-RAY UNITS WERE ADEQUATE FOR ALL MEDICAL **EXAMINATIONS**... BUT **TREATMENT** SOMETIMES DEMANDED HIGHER VOLTAGES..."

DOCTOR, YOU MEAN THERE'S NO WAY YOU CAN SAVE MY WIFE?

SOMETIMES X-RAYS ARE VERY HELPFUL IN TREATING CANCER... BUT THE DISEASE IS TOO DEEP FOR THE RAYS TO REACH IN THIS CASE. PERHAPS SOMEDAY WE WILL HAVE MORE POWERFUL X-RAYS...

"SO COOLIDGE ROLLED UP HIS SLEEVES AND WENT TO WORK. AGAIN HARD WORK AND PERSEVERANCE SOLVED THE PROBLEM...WITH THE **SECTIONAL TUBE**, BASED ON THE 'CASCADE' PRINCIPLE."

VOLTAGE IS APPLIED TO THE ELECTRONS AS THEY PASS THROUGH EACH SECTION. THE FINAL POWER EQUALS THE TOTAL VOLTAGE OF ALL THE "BOOSTS" ...500,000... 1,000,000 AND EVEN HIGHER VOLTAGES!

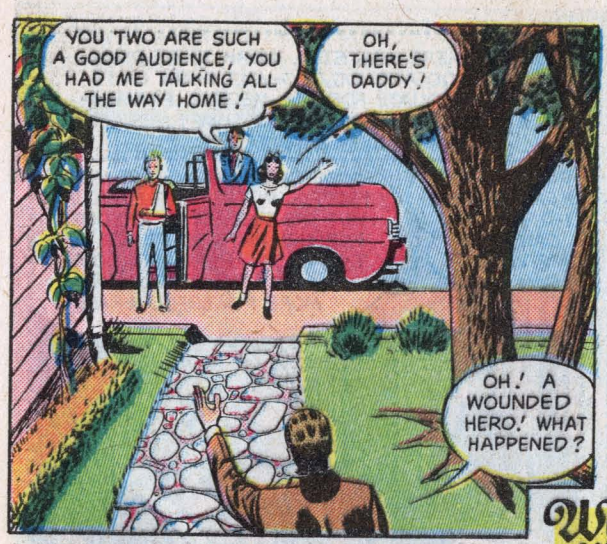
THERE'S THE SAME IDEA. EACH TIME HE HITS THE HOOP, IT ROLLS FASTER AND FASTER!

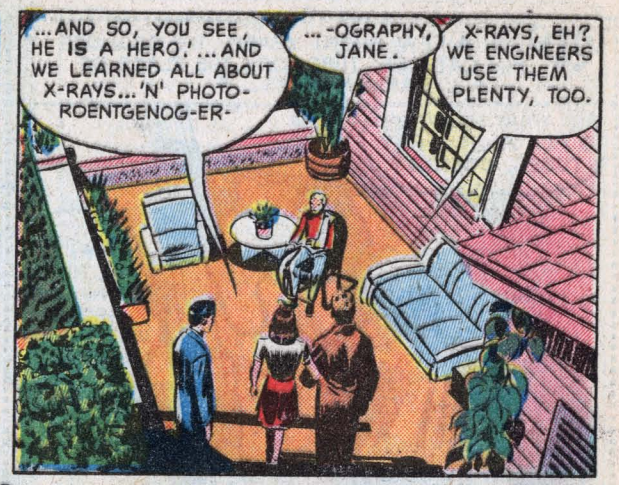
"TODAY, COOLIDGE'S POWERFUL SECTIONAL TUBE IS GIVING NEW HOPE TO CANCER VICTIMS..."

THEN, DOCTOR, YOU **CAN** HELP MY HUSBAND?

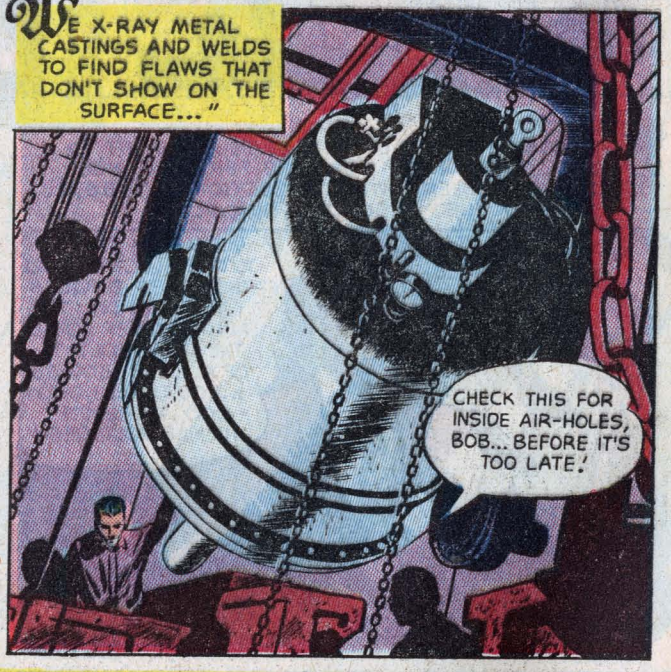
I THINK SO...THANKS TO **EARLY** DIAGNOSIS AND OUR NEW HIGH-VOLTAGE FRIEND THERE.

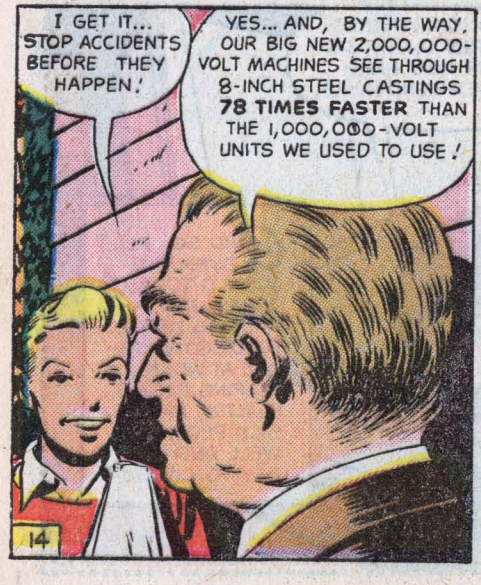
"AND SO, ALL OVER THE WORLD TODAY, X-RAY UNITS--RANGING UP TO 1,000,000-VOLTS--ARE AT WORK... KEEPING PEOPLE HEALTHY, MAKING SICK PEOPLE WELL AND SAVING LIVES!"


YOU TWO ARE SUCH A GOOD AUDIENCE, YOU HAD ME TALKING ALL THE WAY HOME!
OH, THERE'S DADDY!
OH! A WOUNDED HERO! WHAT HAPPENED?


...AND SO, YOU SEE, HE IS A HERO.' ...AND WE LEARNED ALL ABOUT X-RAYS... 'N' PHOTO-ROENTGENOG-ER-
...-OGRAPHY, JANE.
X-RAYS, EH? WE ENGINEERS USE THEM PLENTY, TOO.

YOU, SIR? HOW?
DOZENS OF WAYS, JOHNNY. WHY, FOR EXAMPLE...


"WE X-RAY METAL CASTINGS AND WELDS TO FIND FLAWS THAT DON'T SHOW ON THE SURFACE..."
CHECK THIS FOR INSIDE AIR-HOLES, BOB... BEFORE IT'S TOO LATE!


I GET IT... STOP ACCIDENTS BEFORE THEY HAPPEN!
YES... AND, BY THE WAY, OUR BIG NEW 2,000,000-VOLT MACHINES SEE THROUGH 8-INCH STEEL CASTINGS 78 TIMES FASTER THAN THE 1,000,000-VOLT UNITS WE USED TO USE!
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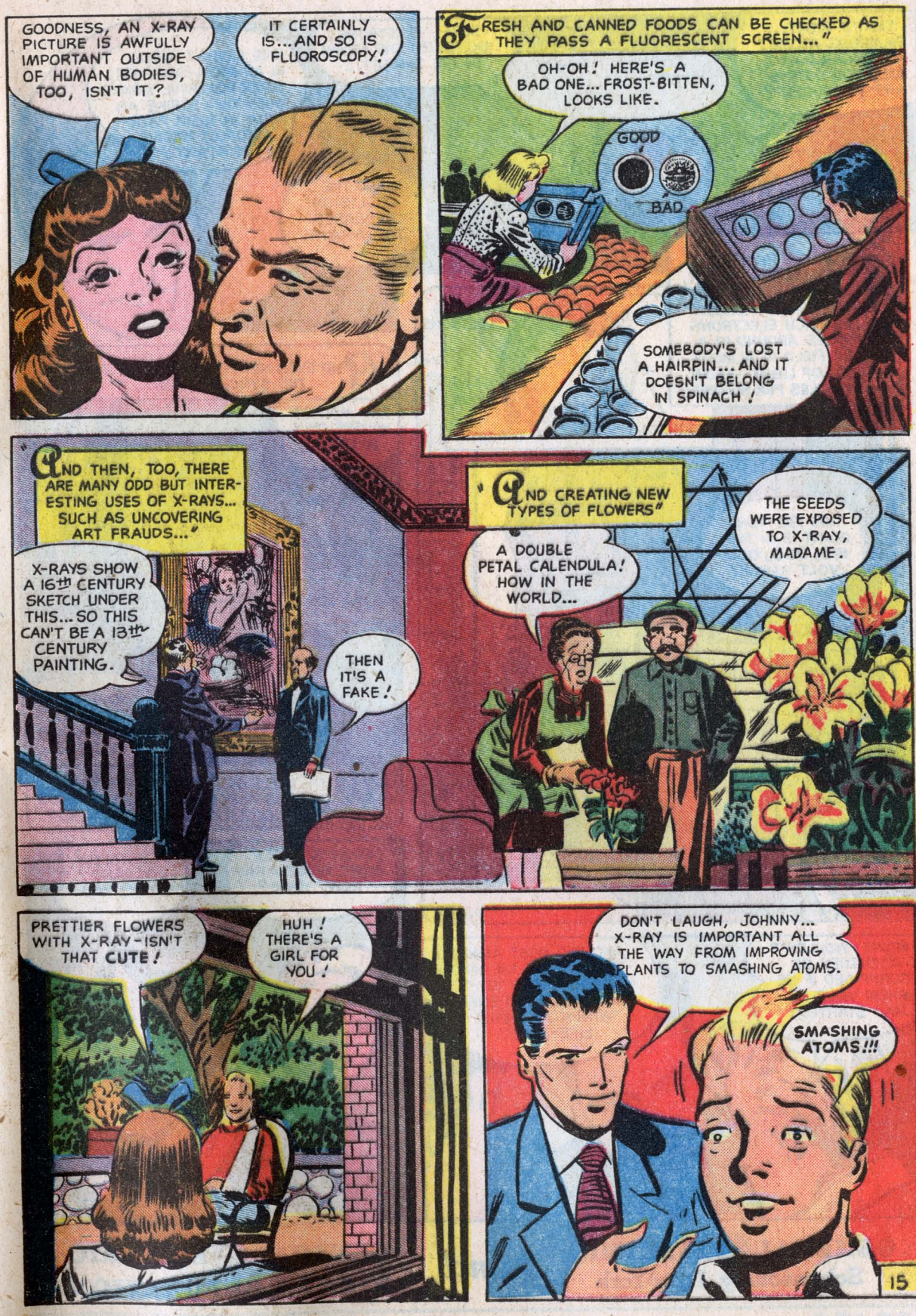
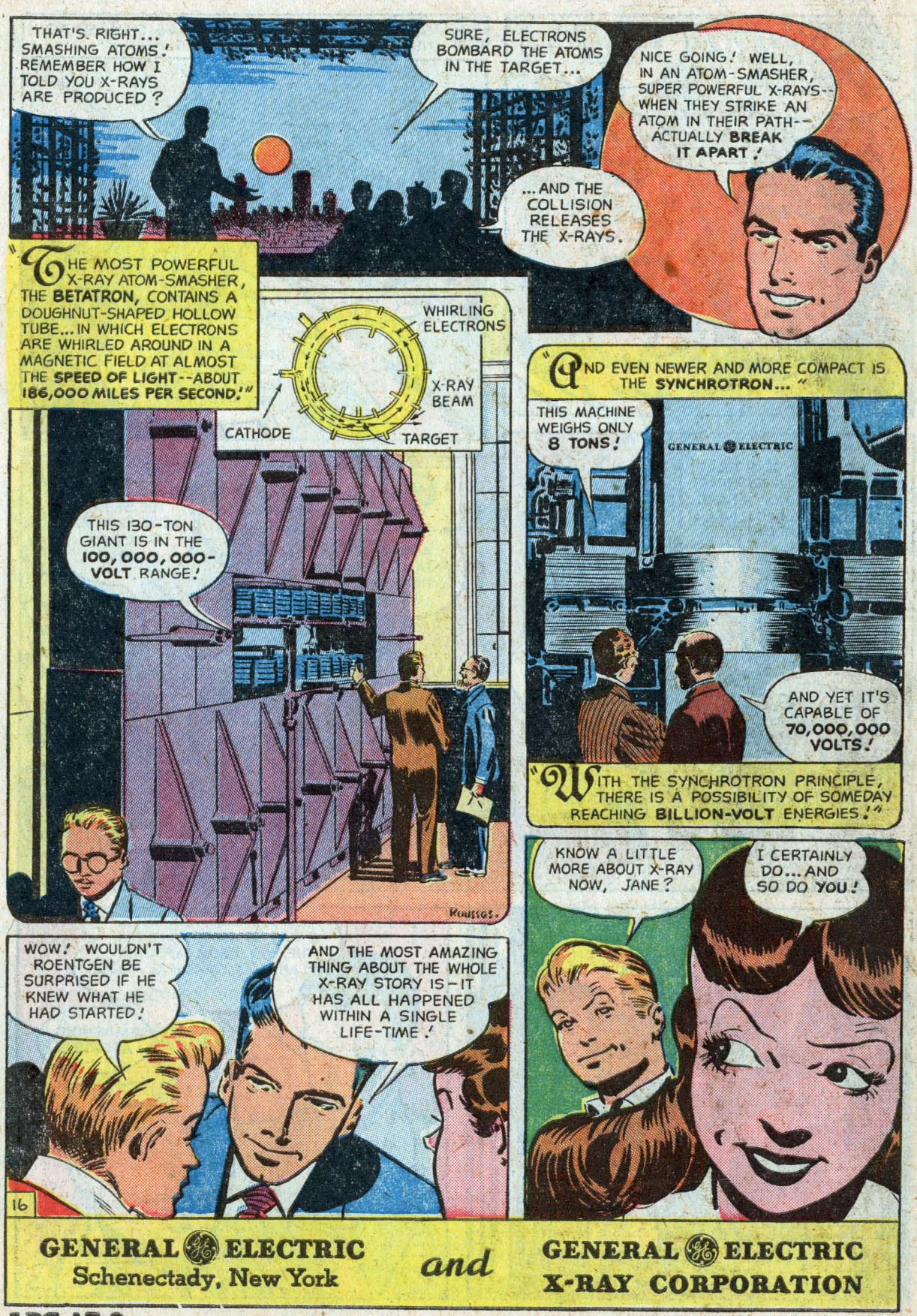
"AND METAL ALLOYS CAN BE 'BROKEN DOWN' BY X-RAYS. PASSING THROUGH ANY UNIDENTIFIED MATERIAL, THE RAYS PRINT A SPECIAL DIFFRACTION PATTERN WHICH CAN BE IDENTIFIED."
WELL, I'LL BITE... WHAT IS IT, JOE?
TIN AND COPPER-- PLUS A LITTLE NICKEL... ACCORDING TO THIS PATTERN.


GOODNESS, AN X-RAY PICTURE IS AWFULLY IMPORTANT OUTSIDE OF HUMAN BODIES, TOO, ISN'T IT?
IT CERTAINLY IS...AND SO IS FLUOROSCOPY!
"FRESH AND CANNED FOODS CAN BE CHECKED AS THEY PASS A FLUORESCENT SCREEN..."
OH-OH! HERE'S A BAD ONE... FROST-BITTEN, LOOKS LIKE.
GOOD
BAD
SOMEBODY'S LOST A HAIRPIN... AND IT DOESN'T BELONG IN SPINACH!
"AND THEN, TOO, THERE ARE MANY ODD BUT INTERESTING USES OF X-RAYS... SUCH AS UNCOVERING ART FRAUDS..."
X-RAYS SHOW A 16th CENTURY SKETCH UNDER THIS... SO THIS CAN'T BE A 13th CENTURY PAINTING.
THEN IT'S A FAKE!
"AND CREATING NEW TYPES OF FLOWERS"
A DOUBLE PETAL CALENDULA! HOW IN THE WORLD...
THE SEEDS WERE EXPOSED TO X-RAY, MADAME.
PRETTIER FLOWERS WITH X-RAY-ISN'T THAT CUTE!
HUH! THERE'S A GIRL FOR YOU!
DON'T LAUGH, JOHNNY... X-RAY IS IMPORTANT ALL THE WAY FROM IMPROVING PLANTS TO SMASHING ATOMS.
SMASHING ATOMS!!!


THAT'S RIGHT... SMASHING ATOMS! REMEMBER HOW I TOLD YOU X-RAYS ARE PRODUCED?
SURE, ELECTRONS BOMBARD THE ATOMS IN THE TARGET...
...AND THE COLLISION RELEASES THE X-RAYS.
NICE GOING! WELL, IN AN ATOM-SMASHER, SUPER POWERFUL X-RAYS--WHEN THEY STRIKE AN ATOM IN THEIR PATH--ACTUALLY BREAK IT APART!
"THE MOST POWERFUL X-RAY ATOM-SMASHER, THE BETATRON, CONTAINS A DOUGHNUT-SHAPED HOLLOW TUBE... IN WHICH ELECTRONS ARE WHIRLED AROUND IN A MAGNETIC FIELD AT ALMOST THE SPEED OF LIGHT--ABOUT 186,000 MILES PER SECOND!"
WHIRLING ELECTRONS
X-RAY BEAM
CATHODE
TARGET
THIS 130-TON GIANT IS IN THE 100,000,000-VOLT RANGE!
"AND EVEN NEWER AND MORE COMPACT IS THE SYNCHROTRON..."
THIS MACHINE WEIGHS ONLY 8 TONS!
GENERAL ELECTRIC
AND YET IT'S CAPABLE OF 70,000,000 VOLTS!
"WITH THE SYNCHROTRON PRINCIPLE, THERE IS A POSSIBILITY OF SOMEDAY REACHING BILLION-VOLT ENERGIES!"
KNOW A LITTLE MORE ABOUT X-RAY NOW, JANE?
I CERTAINLY DO... AND SO DO YOU!
WOW! WOULDN'T ROENTGEN BE SURPRISED IF HE KNEW WHAT HE HAD STARTED!
AND THE MOST AMAZING THING ABOUT THE WHOLE X-RAY STORY IS—IT HAS ALL HAPPENED WITHIN A SINGLE LIFE-TIME!
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GENERAL ELECTRIC
Schenectady, New York
and
GENERAL ELECTRIC
X-RAY CORPORATION

APG-17-3